Topic: Area of a circle

Question: What is the diameter of the circle?

The area of the circle is 8π.

Answer choices:

A $\sqrt{2}$

B $2\sqrt{2}$

C $3\sqrt{2}$

D $4\sqrt{2}$

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Solution: D

The formula for the area of a circle is $A = \pi r^2$, and the area is 8π. Therefore we can say that

$$\pi r^2 = 8\pi$$

Dividing both sides by π gives

$$r^2 = 8$$

$$r = \sqrt{8}$$

$$r = \sqrt{4} \cdot \sqrt{2}$$

$$r = 2\sqrt{2}$$

If $r = 2\sqrt{2}$, then the diameter is double that.

$$2 \cdot 2\sqrt{2} = 4\sqrt{2}$$

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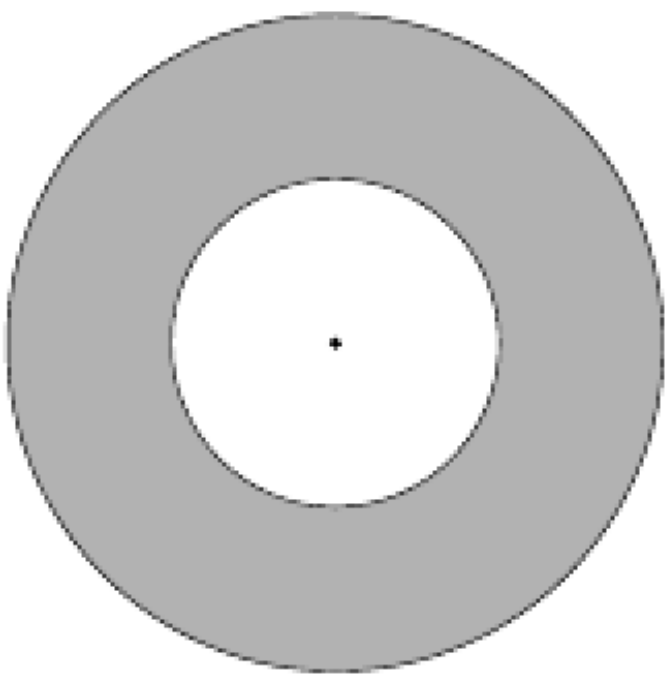
Topic: Area of a circle

Question: What is the area of the shaded region?

The radius of the outer circle is 4 ft and the radius of the inner circle is 2 ft.



Answer choices:

A 2π ft^2

B 6π ft^2

C 12π ft^2

D 16π ft^2

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Solution: C

You need to find the area of the large circle and subtract the area of the smaller circle. What is left will be the area of the ring-shaped region.

For the large circle:

$$A = \pi \cdot 4^2 = 16\pi \text{ ft}^2$$

For the small circle:

$$A = \pi \cdot 2^2 = 4\pi \text{ ft}^2$$

For the ring:

$$16\pi - 4\pi = 12\pi \text{ ft}^2$$

As a side note, 12π is the exact value for the answer, but if you were going to carpet the ring, the people at the carpet store would give you an odd look if you asked for 12π square feet of carpet.

It would be more useful then, to find the approximate area value using $\pi = 3.14$.

$$12 \cdot 3.14 \approx 37.7 \text{ ft}^2$$

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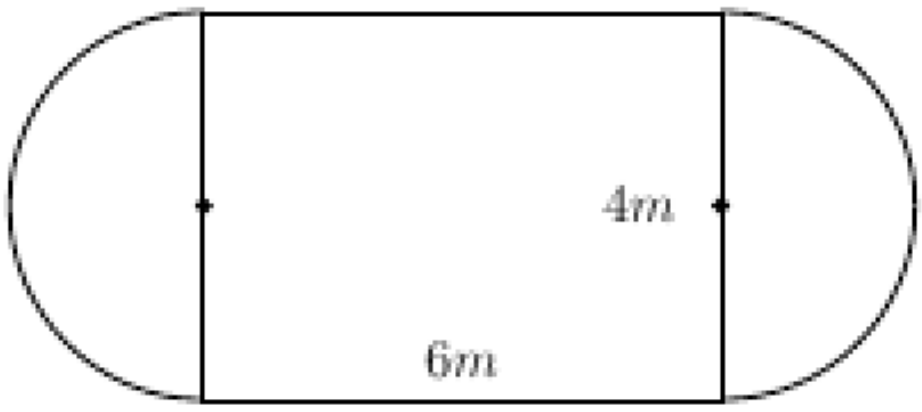
Topic: Area of a circle

Question: What is the area of the figure?

The figure shows a 4 m by 6 m rectangle with a semicircle on each end.



Answer choices:

A $24 + 4\pi$ m^2

B 24π m^2

C $24 + 16\pi$ m^2

D 28π m^2

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Solution: A

You can see that the diameter of each semicircle is 4 m, so the radius of each is 2 m.

Two semicircles add up to one complete circle so we need to add the area of one circle and one rectangle.

For the circle:

$$A = \pi r^2 = \pi \cdot (2)^2 = 4\pi \text{ m}^2$$

For the rectangle:

$$A = lw = 4 \cdot 6 = 24 \text{ m}^2$$

Adding these together, the total area is $24 + 4\pi$ m^2.

You could also find the approximate value using $\pi = 3.14$.

$$24 + 4(3.14) \approx 36.6 \text{ m}^2$$

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